CAS RBC Dependency and Calibration Working Party (DCWP)

November 12, 2014

Presenting today:
Allan Kaufman
Robert Butsic
Manolis Bardis and Christian Citarella

Agenda

- Overview of DCWP charge and structure
- Reports on:
  - Policyholder - Beyond VaR and TVar
  - RBC Reserve Factors vs. Individual Company Risk Assessment

- Q&A Throughout

Introduction

- Dependencies and Calibration Working Party (DCWP) of the CAS
  - Researching methods for calibrating P&C RBC parameters
  - Particularly underwriting and reinsurance risks
  - Many workstreams, many contributors (see appendix)
- Caveats
  - The analyses are solely the responsibility of the work stream participants, DCWP members and not that of their employers, the CAS or the American Academy of Actuaries
  - Presentation assumes the audience has a working knowledge of Standard Formulas
  - Some slides describe preliminary work, which may change materially as research progresses
- Work stream results are published in CAS E-Forum when finalized

Why?

NAIC interest, and:

- A "standard formula" (like RBC) is a component of any regulatory capital structure, whether or not there are internal models or ORSA components.
- Each standard formula (RBC, ICAS, Solvency II) has drawn ideas from its predecessors. We plan to expand on that chain of developments.
- A good study of the standard formula provides data and analytical techniques contributing to individual company risk assessment methodologies.

DCWP Publications To Date

Overview of Dependencies and Calibration in the RBC Formula (**Report 1**)
www.casact.org/pubs/forum/12wforum/DCWP_Report.pdf

2011 Research – Short Term Project (**Report 2**)
www.casact.org/pubs/forum/12wforum/RBC_URWP_Report.pdf

Solvency II Standard Formula and NAIC RBC (**Report 3**)
http://www.casact.org/pubs/forum/12fforumpt2/RBC-DCWPRpt3.pdf

A Review of Historical Insurance Company Impairments (**Report 4**)
http://www.casact.org/pubs/forum/12fforumpt2/RBC-DCWPRpt4.pdf

DCWP Publications To Date

An Economic Basis for P/C Insurance RBC Measures (**Report 5**)
http://www.casact.org/pubs/forum/13sumforum/01RBC-econ-report.pdf

Premium Risk Charges – Improvements to Current Calibration Method (**Report 6**)
http://www.casact.org/pubs/forum/13fforum/01-Report-6-RBC.pdf

Reserve Risk Charges – Improvements to Current Calibration Method (**Report 7**)
http://www.casact.org/pubs/forum/14wforum/Report-7-RBC.pdf

Differences in Premium Risk Factors by Type of Company (**Report 8**)
http://www.casact.org/pubs/forum/14spforum/01-RBC-Dependencies-Calibration-Working-Party.pdf

DCWP Publications Pending

- Differences in Premium and Reserve Risk Charges by Ceded Reinsurance Usage (**Report 9**)
- Reserve Risk Charges – Standard Formula vs. Individual Company Assessments (**Report 10**)
- Insurance Risk-Based Capital with a Multi-Period Time Horizon – Extension of Report 5 (**Report 11**)

DCWP Reports in Preparation

- Dependency and Credit for Diversification in NAIC RBC Formula
- Regression analysis of risk factors associated with insurance company impairments
- Back-testing RBC safety level
- Application of Solvency II Calibration Method to RBC Premium and Risk Factors

DCWP – The People

- Many people contributed to this work (and are still contributing)
- The list of all committee members and the members who are leading or working on specific work streams follows:

Work Stream Participants

Work Stream	Leader	Team
Chair – Allan Kaufman		
Overview Reports 1 and 2	Rept-1 A. Kaufman Rept-2 D. Murphy	Committee members as listed on those reports
3. Solvency II Formula and RBC	Joe Cofield	Christina Zhou
4. Insolvency Risk Factors-Univariate	Ed Marchena	
5. Risk Metric	Bob Butsic	Sholom Feldblum, Glen Meyers
6. Premium Risk Factors	Jennifer Wu, Dennis Franciskovich	Karen Adams, Franco LePera, Daniel Murphy, Tim Sweetser

Work Stream Participants

Work Stream	Leader	Team
7. Reserve Risk Factors	Jennifer Wu	Karen Adams, Dennis Franciskovich, Franco LePera, Daniel Murphy, Tim Sweetser
8. Risk Charge by Type of Co.	Ashley Reller	
9. Charges by Ceded Reinsurance Usage	Jonathan Norton	
10. Rsv Risk Charge - Individual Co Model vs. RBC	Manolis Bardis	Christian Citarella, Glen Meyers, Linda Zhang, Damon Chom
11. Risk Metric and Time Horizon	Bob Butsic	

Work Stream Participants

Work Stream	Leader	Team
12. Dependency	Kean Loh, Apundeep Lamba	Shiwen Jiang, Glen Meyers, Dan Murphy, Damon Chom
13. Insolvency risk Factors-Regression	Jose Couret	
14. Back-testing RBC Safety Level	Natalie Atkinson	
15. Investment Income Offset Factors	James Yu	
16. Solvency II Calibration	Jeff Pflugger, Tim Sweetser	Glen Meyers
17. Risk Factor Based on Combined Ratio	Douglas Norton	
18. Impact Analysis	Ron Wilkinson, Yi Pu	Francis Guo